

REMARKS

By the present amendment, claims 7 and 10 have been amended to obviate the examiner's objections thereto and/or to further clarify the concepts of the present invention. Entry of these amendments is respectfully requested.

In the Action, claims 7-10 were rejected under the second paragraph of 35 USC § 112, first and second paragraphs. Reconsideration of these rejections in view of the above claim amendments and the following comments is respectfully requested.

With regard to claims 7 and 10, the term "opposed" is replaced with "opposite." Such an amendment is supported by the specification, since the term "opposed" appears on page 12, line 21 of the applicants' original specification. Thus, amended claims 7 and 10 are supported by the original specification.

With regard to another rejection to claim 7, as well as to claim 10, "a first and a second upper surface" is amended to read "a first upper surface and a second upper surface." "A first upper surface" and "a second upper surface" are thus separately recited in this amendment. Thus, the alleged indefiniteness of claims 7 and 10 is overcome.

As mentioned above, claims 7 and 10 have been amended herein to obviate the examiner's objections thereto and/or to further clarify the concepts of the present invention. It is submitted that the claims are now in full conformity with the provisions of the cited statute. Accordingly, withdrawal of the rejections under the first and second paragraphs of 35 U.S.C. § 112 is respectfully requested.

As to the merits, claims 1, 7, 8 and 10 were rejected under 35 USC § 102(b) as being anticipated by, or the alternative, under 35 USC § 103(a) as being unpatentable over, the patent to Chen et al. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

With regard to claims 1, 7, 8 and 10, the Examiner states, in the "Response to Arguments" section of the Action:

[i]n regard to Applicant argument that "carbon fiber" is distinguished over "bundle of carbon nanotubes," the argument not persuasive since carbon fiber is the same as bundle of carbon nanotubes – see Brandes et al[.] (US 6,445,006) as an evidence that shows "carbon fiber" and "bundle of carbon nanotubes" are interchangeable terms that has been used in the art to describe material of carbon nanotubes.

Brandes et al. teaches, in col. 2, lines 31-32:

As used herein, the terms "carbon containing microfibers" and "carbon nanotubes" are used interchangeably.

What is taught in Brandes et al. is "micro" fiber. There is nothing in the teachings of Brandes et al. that suggests that usual (i.e., not "micro") fibers and carbon nanotubes are used interchangeably.

Moreover, the above teaching of Brandes et al. starts with "as used herein." This shows that the terms "carbon containing microfibers" and "carbon nanotubes" are used interchangeably only in the Brandes' specification, and does not show that the interchangeability also holds for the fibers in the art.

In this manner, with due respect to the Examiner, the Examiner misinterprets the teaching of Brandes et al.

With regard to Chen, the Examiner states the following in lines 1 - 3, page 4 of the Office Action:

a heat conductor (33, col. 5, lines 4-38) formed in a first hole (27) in the SiC substrate and made of bundle of carbon nanotubes (carbon fiber) inherently oriented in a depth direction of the first hole"

Contrary to the Examiner's assertion, there is nothing in the teachings of Chen that suggests that the carbon fiber is inherently formed in a depth direction of the first hole. Therefore, Chen does not anticipate claims 1, 7, 8 and 10.

With regard to claim 10, the Examiner states the following (quoting from page 5 to page 6 of the Office Action:

second heat conductor 33b filling hole 27b would inherently entirely cover the first surface since the lower first surface of the substrate 25 is the surface that define the hole 27b.

The applicants disagree with Examiner's assertions for several reasons.

First, the alleged term "first surface" is not recited in claim 10.

Second, what is recited in claim 10 is "first upper surface." The term "upper" makes it clear that the intended surface is "upper surface" of SiC substrate. Therefore, the Examiner's assertion, which deems the "upper surface" as an inner surface of the hole 27b, is moot. It is also noted that the same arguments were made in the last response, but the Examiner is silent about it in the "Response to Arguments." The applicants respectfully request that their above assertion be entered.

Thus, Chen does not anticipate claim 10.

It is submitted that the Chen patent does not teach or suggest the semiconductor device as defined by independent claims 1, 7 and 10 and the claims dependent thereon. Among other things, claims 1, 7 and 10, as amended require, at least in part, that a heat conductor is made of bundle of carbon nanotubes.

In distinct contrast, the patent to Chen discloses demountable heat spreader. In particular, the patent to Chen discloses a heat spreader 25 with a thermal interface material 33 made of carbon fiber as is set forth in column 5, line 24. In this regard, "carbon fiber" is distinguished over "bundle of carbon nanotubes" as required in claims 1, 7 and 10. Among other things, it is submitted that the concept of "nanotube" is different from that of "fiber."

In addition, with regard to the subject matter of claim 10, it was asserted in the Office Action that the first surface the substrate 25 according to the Chen patent was the surface that defines hole 27b. It is submitted that such is not correct. Claim 10 defines "a second heat conductor formed to cover the first upper surface of the SiC substrate entirely... ." Thus claim 10 requires, not the inner surface of the hole , but the "upper surface" of the SiC substrate.

In conclusion, it is respectfully requested that the examiner reconsider the above rejections and allow the claims as amended which distinguish over the teachings of the cited Chen et al. patent. Accordingly, withdrawal of the rejection under 35 U.S.C. §102 (b) and §103(a) and allowance of claims 1 through 10 as amended over the cited Chen et al. patent are respectfully requested.

Applicants acknowledge with appreciation the indication that claims 2 - 6 would be allowable if rewritten to include all the limitations of the base claim. However, to amend the claims as suggested would unnecessarily narrow or limit the scope of the claims to which the applicants are entitled.


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In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

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Enclosure: Petition for Extension of Time